Lisbon School of Economics & Management
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DISSERTATION

PERFORMANCE AND RISK OF SHARIAH-COMPLIANT INVESTMENT AND SOCIALLY RESPONSIBLE INVESTMENT

SADAF TABRIZI

December - 2022

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SUPERVISION: PROF TIAGO CRUZ GONÇALVES

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RESUMO

Investimentos islâmicos e socialmente responsáveis tornaram-se temas de pesquisa populares entre os académicos à medida que testemunhamos o crescimento mundial da população islâmica e as preocupações com questões ambientais, sociais e de governança. Acredita-se que os investidores podem agora investir em instrumentos financeiros de acordo com suas crenças sociais e religiosas sem sacrificar ganhos e objetivos financeiros. A primeira parte deste estudo aborda e compara os critérios gerais de triagem submetidos aos portfólios islâmicos e socialmente responsáveis, enquanto a seção quantitativa avalia o risco e o desempenho desses dois estilos de investimento. A dissertação explora se a triagem adicional no investimento islâmico e socialmente responsável leva a resultados financeiros fracos e se os índices islâmicos apresentam desempenho inferior aos índices sustentáveis devido às limitações relacionadas com Shariah. A seção empírica desta dissertação analisa o desempenho de dois principais índices europeus islâmicos e sustentáveis do índice da família Dow Jones, comparando o desempenho do retorno ajustado ao risco com a implementação dos modelos CAPM de três fatores e quatro fatores Fama-French. Cobrindo o período de 2005 a 2021, os resultados da dissertação mostram que o índice islâmico Dow Jones oferece melhores retornos enquanto também implicam um pouco mais de risco do que o índice sustentável Dow Jones. No entanto, os resultados também concluem que tanto os portfólios sustentáveis quanto os islâmicos fornecem retornos excedentes negativos em comparação com o portfólio do mercado europeu.

Classificação JEL: G11; G12; G14; G23; Q56

Palavras-Chave: Finanças Islamicas; Shariah; Investimentos Financeiros Socialmente Responsáveís; Dow Jones; CAPM; Fama-French 3 Fatores; Carhart 4-Fatores

ABSTRACT

Islamic and socially responsible investing have become popular research subjects among scholars as we witness worldwide growth in Islamic population and concerns over environmental, social and governance issues. It is believed that investors are now able to invest in financial instruments in accordance with their social and religious beliefs without having to sacrifice financial gains and objectives. The first part of this study discusses and compares the general screening criteria subjected to Islamic and socially responsible portfolios, while the quantitative section evaluates risk and performance of these two investment styles. The paper explores whether additional screening in Islamic and socially responsible investing leads to poor financial results, and whether Islamic indices further underperform sustainable indices due to their Shariah limitations. The empirical section of this paper reviews the performance of two major European Islamic and sustainable indices from the Dow Jones family index by comparing risk-adjusted return performance with the implementation of Fama-French three-factor and four-factor CAPM models. Covering the period of 2005 – 2021, the results of the paper show that the Islamic Dow Jones index provides better returns and carries slightly more risk than the sustainable Dow Jones index. However, the results also conclude that both the sustainable and Islamic portfolios provide negative excess returns in comparison to their European market portfolio.

JEL: G11; G12; G14; G23; Q56

Keywords: Islamic finance; Shariah; Socially responsible finance; CAPM; Dow Jones; Fama-French three factor; Carhart four factor

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To my family

GLOSSARY

AAOIFI – Accounting and Auditing Organization for Islamic Financial Institutions

CAPM – Capital Asset Pricing Model

DJIEUR – Dow Jones Islamic Europe Index

DJSEUR – Dow Jones Sustainability Europe Index

E – Environment

S – Social

G – Governance

FTSE - Financial Times Stock Exchange Group

MSCI - Morgan Stanley Capital International

SRI – Socially Responsible Investing

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1. INTRODUCTION

Shariah-compliant investments and socially responsible investments (SRI) have much in common. Shariah-compliant investments or Islamic investments are considered socially responsible due to Shariah financial principles prohibiting unethical investments, such as the prohibition against investing in alcohol, pornography, gambling, etc.

Socially responsible and Shariah compliant investing have been growing rapidly over the last decades. The rising Islamic population and ESG concerns have put SRI and Islamic investing in the spotlight for investors, where they are now able to invest freely into financial instruments while abiding by their social and religious beliefs (Farook, Zaheer, 2015). The Islamic Financial services industry report in 2017 documented a total asset valuation of approximately 1.89 trillion US dollars in 2016 at an annual growth rate of 15-20%. On the other hand, socially responsible investing has been highly led by the European and US markets. In 2016, SRI investing had 21.4 trillion US dollars in global assets under management (Erragragui, 2018).

Both Shariah-compliant and SRI began with their roots in religion, however, SRI nowadays concerns itself more with social and environmental issues, whereas Shariah-compliant investing remains as purely religious-based. Although Islamic and SRI investing share similar values, there is no direct focus on one another, i.e. Shariah-compliant investments do not necessarily invest in industries that support environment, human rights (Forte and Migilietta, 2011). While many of the same screening criteria, including the prohibition on unethical investments, are applied to categorize both SRI and Shariah-compliant investments, Shariah-compliant investment is different in the sense that, it goes one step beyond SRI screening by adhering to the exclusion of stocks and companies in violation of Shariah financial screening criteria.

According to previous literature such as those of Bukhari and Azam (2015), additional screening in investment can result in poor financial performance, and that harsher screenings in Islamic investment may lead to even more severe effects on return performance. Since an investor's first objective is to maximize his or her financial gains, it is important to investigate whether screening criteria subjected to Islamic and socially responsible investing result in undesirable return performance. This paper provides a deeper insight and understanding to

ethical investors looking to diversify their portfolio without sacrificing their financial goals or ethical values and standards.

The empirical section of the study examines the return performance of two major Dow Jones Europe indices. Europe is chosen to be studied in this paper due to the large growth of SRI and Islamic finance in the region. The findings make contributions to the literature in this sense that the results are based on the Dow Jones European indices, whereas most of the prior literature focused on Dow Jones world indices. The analysis implements the use of Fama-French (1993) three-factor and Carhart (1997) four-factor models and examines the profitability of the two major indices. The reason for including the Carhart four-factor model is because previous research show that the additional factor has significant explaining power on portfolio returns and can provide better results than the three-factor model.

In summary, we conclude that our research hypothesis cannot be validated through the empirical results observed, and that the models chosen are effective at explaining the variation in DJIEUR and DJSEUR returns. The three-factor Fama-French regression results show that the Islamic and socially responsible Dow Jones indices both provide slightly negative excess returns against their European benchmark portfolio throughout the period of 2005 – 2021. The results show that the DJSEUR can be classified as the least risky but worst preforming portfolio among the three. Moreover, in contrast to previous research, the results from the improved Carhart four-factor model show that the inclusion of a momentum factor does not provide meaningful explanation on the variation in DJIEUR returns. However, we do observe a significant tendency for down-stock effects to persist when the same is applied to DJSEUR returns.

The work is structured as follows: the first section of the paper provides a comprehensive summary of past literature on Islamic and socially responsible investing. This section mainly focuses on discussing the history, origin, and values behind Islamic and socially responsible finance. The second section introduces the historical data, methodology and the developed hypothesis in preparation for the empirical analysis section. The third section provides the analysis and interpretation on the obtained empirical results and lastly, the fourth section presents the conclusions, research limitations and suggestions for future studies.

2. LITERATURE REVIEW

2.1 History and origin of Shariah-compliant and socially responsible equity Investment

The first official Islamic fund, Daina Al-Aiman, was founded in Malaysia in 1968, but it wasn't until 1992 that the International Islamic Fiqh Academy, Jeddah issued a ruling officially approving the trading of common stocks of companies that avoid engaging in activities that violate Shariah principles (Mahfooz and Ahmed, 2014). There are 12 jurisdictions that account for 92% of the global Islamic banking assets, with the largest being Iran, Saudi Arabia, the UAE, Malyasia, Kuwait and Qatar (Yesuf and Aassouli, 2020). Although the Muslim population represents almost 25% of global population, only less than 1% of financial assets are Shariah-compliant (PricewaterhouseCoopers, 2009). According to the Islamic Finance Development Report (2018), the global Islamic finance industry grew year-on-year by 11% to US$2.4 trillion in assets in 2017. Furthermore, the report projects an average growth of 10% per year in the Islamic finance industry, representing a total growth in assets to US$ 3.8 trillion by 2023.

Islamic finance stemmed as faith based with its roots in religion and operates in accordance with Shariah principles (Islamic law) until this day. Muslim investors must ensure that the business activities and financial structure of the companies they invest in adhere to Shariah-principles. Shariah refers to the commands, prohibitions, guidance and principles that God has addressed to mankind pertaining to their conduct in this world and salvation in the next (Ismail and Muqorobin, 2017). Investing and financing certain types of goods and services is considered unlawful or sinful (*Haram*) and consequentially excluded from Islamic finance.

All publicly issued and traded Islamic financial instruments are subject to Shariah screening methods supervised by an independent body of Islamic scholar in Islamic commercial jurisprudence, also known as the Shariah board. The ruling of the Shariah board is binding, and screening is aimed to assess whether a company's operations and transactions comply with Shariah law (Forte, Miglietta, 2011). The general consensus is that the business does not deal with *ribā* (i.e., interest), *gharar* (i.e., risk) and *maysir* (i.e., speculation), and that the business activities are approved from a Shariah perspective. The Shariah screening process can be categorized into two main criteria: qualitative sector screening and quantitative financial

screening. For a company to qualify as Shariah compliant and included in Islamic finance, it must meet requirements in both screening criteria (Mahfooz and Ahmed, 2014).

The qualitative screening process can also be known as business screening. During this stage of screening, each company's business operations are assessed to ensure that they do not engage in financing activities prohibited by Shariah principles, such as *riba* (i.e., interest), excessive *gharar* (i.e., risk), *maysir* (i.e., speculation), tobacco, alcohol, pornography, gambling, weaponry, and pork-related products (Bukhari and Azam, 2015). This means that, investing in companies dealing with conventional banking, insurance, breweries, casinos, adult entertainment, and such, are considered Shariah non-compliant (Yildirim and Ilhan, 2018).

Where qualitative screening takes into consideration a company's business activity, the quantitative screening analyses a company's level of interest income, debt, and receivables. According to the Accounting and Auditing Organization for Islamic Financial Institutions, AAOIFI Shariah Standard No. (21), for companies to be categorized as Shariah-compliant, certain quantitative financial ratios must also be satisfied in addition to business activities that are deemed Shariah-permissible. It is essentially condemned by Shariah principles for companies to borrow money on interest or deport their surpluses into interest-bearing securities (Forte and Miglietta, 2011). However, due to the current capitalistic-oriented system, companies are automatically exposed to *riba*. If the screening demands that all companies generating income through such financing activities be filtered out, it would result in the vast majority being excluded as Shariah non-compliant. In order to adapt to this, Shariah scholars have set a tolerance level of income generated through non-permissible activities (Mahfooz and Ahmed 2014). The tolerance level of income demands that a company's income from impermissible activities divided by its total revenue, must be below 5%. (As previously mentioned, these activities may include dealing with *riba*, tobacco, pornography, etc.). If and when a company fails the first level of Shariah screening, it is ruled out as Shariah non-compliant, and quantitative screening is carried out with the remaining companies.

Shariah-compliant indices have become prevalent within the financial industry due to the rapid growth of Islamic finance. Investors are now able to select from hundreds of stock options to invest in based on region, industry, investment objective, and market capitalization. Renowned global financial services, such as those of Dow Jones, the FTSE, Standard & Poor's, MSCI, etc. have all come to offer numbers of Islamic indices to support this (Bukhari and Azam,

2015). Although, clearly defined qualitative screening criteria have been established among Shariah scholars, opinions often diverge concerning quantitate screening demands (Yildirim and Ilhan, 2018). A notable lack of standardization exists in this regard, meaning that the exact values of the tolerated financial ratios might differ among Islamic Supervisory boards (Bukhari and Azam, 2015).

For the purpose of this research, we take into consideration the screening criteria established by Dow Jones Shariah Supervisory board. The Dow Jones Islamic Market (DJIMI) Index launched in 1999 as the first global Shariah index provider and is considered to be the pioneer of all Shariah indices in definition and application of Shariah screening methodology. (Yildirim and Ilhan, 2018).

The quantitative screening seeks to test the level of debt, cash, interest-bearing securities, and accounts receivables against the threshold determined by the Shariah Supervisory board. For a company to pass its qualitative screening, certain financial ratios must be less than 33% (Dow Jones, 2022):

- Total debt divided by trailing 24-month average market capitalization.
- The sum of a company's cash and interest-bearing securities divided by trailing 24-month average market capitalization.
- Accounts receivables divided by trailing -month average market capitalization.

Eventually, companies passing both the qualitative and quantitative screening criteria are classified as Shariah compliant and listed in the DJIMI.

On the other hand, sustainable, responsible and impact investment, i.e., Socially Responsible Investment (SRI), or Corporate Social Responsibility (CSR) share some similarities with Islamic or Shariah-compliant Investment, in the sense that the origin of SRI was also rooted in religion (Suryomurti, 2018) and are both considered *ethical*, as ethics and religion tend to come hand in hand.

SRI investing was developed before Islamic finance, dating back to the money management practices of the Methodists in the 18th century. The Methodists were followed by the Quakers, who avoided engaging in investments that would in turn fuel war and slavery (Sokolovska and

Kešeljević, 2019). Eventually, the first SRI fund, the Pioneer Fund, was launched in 1928 with the motive of avoiding sin stocks (Malik, Nurullah and Dar, 2015). According to the Global Sustainable Investment Review (2018), sustainable investment has grown in almost all regions globally. The start of 2018 witnessed SRI investment assets reach US$30.7 trillion, representing a 34% growth from 2016, with the five major markets being Europe, United States, Japan, Canada, and Australia/New Zealand.

According to the definition provided by the European Sustainable Investment Forum (Eurosif, 2010), socially responsible investments combine investors' financial objectives with their concerns about environmental, social, and governance (ESG) issues. Eurosif is the leading European membership association whose mission is to develop sustainability through European financial markets. It works as a non-profit partnership of eight national Europe-based Sustainable Investment Forums (SIFs) with the support and involvement of Member Affiliates.

Despite the increasing popularity in the SRI industry within the recent years, investors have raised concerns on the lack of a clear definition on investments that can be classified as socially responsible, the quality of available data on ESG ratings of companies as well as the absence of SRI investment standards (Widyawati, 2019). This means that there is no existing theoretical model determining the optimal trade-off between social responsibility in regard to environmental, social and governance indicators as well as other investment criteria, including risk and return. Selecting, applying, and reporting investment screening for SRI has presented its own challenges and opportunities for companies, investors, and fund managers due to the lack of a homogeneous consensus reached on how much social responsibility is considered appropriate (Camilleri, 2017).

Generally, SRI investors seek to invest in profitable companies that make positive contributions to our society by performing good ESG practices through their daily business activity. These activities include product sustainability, caring for employees, protecting people and environment, ethical trading, and getting involved in the local community (Ismail and Muqorobin, 2017; Capelle-Blancard and Monjon, 2012). A more detailed overview of ESG issues and concerns can be found in Table 1:

Table 1 – ESG issues criteria

Environmental Issues	Social Issues	Governance Issues
Water pollution	Data protection	Board composition
Air pollution	Diversity	Accounting standards
Biodiversity	Employee relations	Anticompetitive behaviour
Climate change	Government relations	Bribery and corruption
Deforestation	Community relations	Compliance

Source: Hayat, 2019

With the lack of a general consensus on global practice for SRI, we consider the definition set by Eurosif (2021), which offers a comprehensive classification of SRI strategies:

1. Best in class

During this approach, the best-performing or most improved companies within a universe, or class are selected or weighted based on ESG criteria and analysis.

2. Engagement & voting

A long-term process that accounts for engagement activities and active ownership through voting of shares and engagement with companies on ESG matters. Engagement on ESG issues is often referred to as shareholder activism.

3. ESG integration

During the ESG integration process, the objective is to focus on the potential impact of ESG issues on company financials (positive or negative), which in turn may affect the investment decision.

This part of the process goes beyond the mainstream analysis of investments and considers ESG factors alongside financial factors.

4. Exclusions

This exclusion process is an approach that shares some resemblance with Shariah business screening. This process focuses on the exclusion of companies, sectors or even countries from the pool of SRI universe if involved in impermissible activities based on specific criteria. This

exclusion criteria are commonly applied to weapons, pornography, tobacco, and animal investing.

5. Impact investing

Impact Investments considers investments made into companies, organizations, and funds that intend to create positive social and environmental impact in addition to financial return. Impact investment includes microfinance, community investing, social business/entrepreneurship funds, etc.

6. Norms based screening

Norms based screening considers an investment's compliance with international standards and/or norms covering ESG factors. International norms on ESG are those defined by international bodies such as the United Nations (UN).

7. Sustainability themed

Sustainability themed investment inherently contribute to dealing with social and/or environmental challenges such as climate change, eco-efficiency, and health.
It is required to have an ESG analysis or screen of investments for funds to be considered within this approach.

According to Zinkin and Williams (2006), companies that address ESG issues tend to outperform in the long term because the nature of these issues involves avoiding costly controversies and conflicts, attracting better staff, developing more reliable supply chains, and enjoying better relationships with the communities in which they operate.

2.2 Shariah-compliant investments versus socially responsible investment: complimentary or contrary?

The concept of corporate social responsibility is deeply embedded into Islamic investing. According to Imam Al Ghazali (1058 – 111 CE), "The objective of Shariah is to promote well-being of all mankind, and to serve the public interest (maslaha)". *Maslaha* can be classified into three categories, including *daruriyyat* (essentials), *hajiyyat* (complementary) and *tahsiniyat* (embellishments). When these three categories are placed into a pyramid structure, the most important would be daruriyat by which essential needs are provided. These include

safety of employees, welfare, life, environment, intellect and posterity (Malik, Nurullah and Dar, 2015). These are qualities that are not only exclusive to Islamic investment and finance, but also adopted by SRI. Exclusions on investing in alcohol, tobacco, drugs, pornography, prostitution, weaponry, and so on, are also similarities between both SRI investing and Shariah-compliant investing. Both investment styles are based on principles that portray the importance of implementing what's best for the community in terms of social, religious and ethical standpoints, instead of investment purely for the sake of profit (Mahfooz and Ahmed, 2014),

SRI and Shariah-compliant investments both take into consideration the long-term goals and perspectives. ESG factors are seen as a contributor to long-term investment performance and success by accessing opportunities, as well as avoiding and mitigating risk. On the other hand, a report done by the Islamic Research and Training institution and the Islamic Development Bank highlighted the suitability of Islamic finance for long term investments such as development investment. Islamic finance bases itself on addressing long term risk, making it both stakeholders focused and long-term oriented (Cheong, Salleh and Fung, 2019).

It is believed that for the Islamic finance industry to achieve success there must be more collaboration between the Islamic finance and SRI industry (Wilson, 1997). According to Dusuki and Abdullah (2007), promoting CSR concepts in the Islamic funds industry can have two important benefits. Firstly, it would attract ethical investors to the Islamic funds industry, and in turn would increase investment in Shariah-compliant investments. Secondly, it would help SRI investors diversify their portfolio by including Islamic investments which tend to be less risky.

SRI and Shariah-compliant investing share many similarities, however, many differences still exist between the two. For instance, although SRI began with its roots in religion just as Islamic investing, in today's modern world, SRI investors are more prompted to follow the ESG criteria due to rising societal issues such as climate change and gender diversity accompanied by the reduction of religious influences in the west. On the other hand, Islamic finance today remains of purely religious purposes (Malik, Nurullah and Dar, 2015).

Table 2 below represents the similarities and differences between Islamic finance and SRI:

Table 2 – Comparison between Islamic Investment and SRI Investment

	Islamic Investment	SRI Investment
Purpose of Investment	Following Shariah principles while seeking financial return	Following ESG criteria while seeking financial return
Investment Rules	Shariah principles	Socially responsible investment policy
Advisory Board	Shariah advisory board	Ethical board
Assets of Investment	Shariah-compliant stocks	Ethical stocks
Business Ratios	Invest in Shariah compliant business only	Invest in socially responsible business only
Financial Ratios	Control of a company's exposure to interest income and expenses to be Shariah-compliant	No financial ratios needed to be approved as socially responsible investment
Binding Religious Rules	Yes	No (sometimes the motives can be faith based, but not binding)
Screening Based on ESG criteria	No	Yes

Source: Adopted from Mailk, Nurullah, Dar, 2015

As mentioned previously, Islamic finance prohibits the use of *riba* (interest), whereas SRI investment does not seek to avoid the taking and receiving of interest. This would make it so that a conventional bank could be qualified as a sustainable bank but would be in violation of Shariah finance principles (Mansor et al., 2020). Socially responsible fund managers are able to perform certain trading strategies which would not be considered Shariah-compliant, including margin trading or short selling. Moreover, the use of derivatives is also limited (Miglietta and Forte, 2011).

Another distinguishment between SRI investing and Islamic finance would be the core markets of the two. A report conducted by Thomson Reuters Responsible Finance Institute (2015) shows that responsible finance has been dominated by the west, whereas Islamic finance has most been dominated by markets within the Organisation of Islamic Cooperation countries.

A research report done by Yesuf and Aassouli (2020) on Islamic finance and ESG considerations states that ESG scores from more than 5,000 non-financial companies suggest a direct correlation between Shariah compliance and higher ESG scores. The analysis within

the report shows that financial Shariah-compliant companies have ESG scores that are 6% higher than for those excluded by the Shariah screening process. In the case of non-financial companies, Shariah-compliant companies have ESG scores that are 10% higher. ESG scores for Shariah-compliant companies in comparison to non-compliant companies were higher by 7.3%, 7% and 3% for environmental, social and governance issues, respectively.

According to the Islamic Finance ESG Outlook by Refinitiv (2019), based on the analysis performed on the 6,554 companies in Refinitiv's EIKON global database, it is evident that Shariah-compliant companies on average received ESG scores 5.9% higher in comparison to companies that are not compliant.

An empirical study done by Mansor and Bhatti (2020) investigated the investment performance of Malaysian Islamic equity funds against matching samples of conventional equity funds relative to their market benchmark. The study comprises data from thirty Malaysian Islamic equity fund's monthly returns from 1990 to 2009, and a matched sample of thirty generated Malaysian conventional equity funds. The Bhattacharya-Pfleiderer model was employed to obtain a robust result. The empirical findings indicate that Islamic funds do not match conventional counterparts in selectivity or stock-picking skill. They also concluded that the matching conventional funds have slightly higher average return, variance, and beta than the Islamic funds.

A study by Auer (2014) tests whether socially responsible stock selection adds or destroys value in terms of portfolio performance. The study does so by analysing the effects of SRI screens on portfolio performance using constructed portfolios based on negative screens using Sustainalytics ESG scores. Using Sharpe ratio as the performance measurement, these portfolios are then compared to an equally weighted benchmark portfolio comprising the entire European stock sample ranging from 2004 to 2012. The results show that negative screens with low cut-off rates are a good first choice for investors. Simple negative screens that exclude unrated stocks provide significantly higher performance than a passive benchmark strategy. The results also indicate that environmental and social selection did not generate any significant additional value, whereas governance screens did provide significant performance gains. This is in line with another study done by Erragraguy and Revelli (2015). They measure the portfolio performance of combining Islamic investment practices with positive SRI practices using the four-factor method developed by Fama and French (1993) and Carhart (1997). The results of

their study show that Islamic portfolios that exhibit partial good governance and significant diversity achieve better performance compared with their traditional Islamic peers during 2007-2011. Auer (2014) finally concludes that managers can implement ethical screens without harming their portfolio, and that certain screens can be used to increase portfolio performance.

A study done by El-Masry, López, Sáez, Ausina (2016) compares the performance of Islamic and conventional funds during the crisis and recovery periods between 2006 and 2013 in the MENA region using the Fama-French three factor (3FF) model. Their empirical results show that Islamic funds performed better than conventional funds in the GCC region throughout the period in consideration. The study also confirms Islamic funds to be slightly less risky than conventional funds.

There is other research available in favor of the conclusion that Islamic funds exhibit less risk than their conventional counterpart. Bukhari, Azam (2015) conducted a study using the 3FF model to evaluate the performance of Islamic equity mutual funds and socially responsible mutual funds with their respective benchmark in the global market. Their results also show that Islamic and SR funds have low betas against individual and broader market benchmarks and would make an attractive option for risk-aversiveness or during times of high volatility.

As the number of SRI and Shariah compliant investors continue to grow within the European region, the purpose of this paper is to compare the performance behavior of two major Islamic and SRI indices within the European market using the Fama-French three factor (1993) and Carhart four factor (1997) model.

3. METHODOLOGY AND DATA

3.1 Hypothesis

Following the literature review, this paper takes on the approach by Auer (2014), Bukhari (2015), Erragraguy and Revelli (2015) using Capital Asset Pricing (CAPM) and multifactor models. The three factor (3FF) model and four factor (4FF) developed by Fama and French (1993) and Carhart (1997) are applied to returns of the Dow Jones Sustainability Europe (DJSEUR) and Dow Jones Islamic Europe (DJIEUR) to assess portfolio performance. Islamic finance not only tackles the limitation on the type of business activity that one is allowed to

invest in, but it also abides by certain financial ratios, as previously mentioned in the literature review. Research done by Capelle-Blancard and Monjon, (2012) shows that excessive screening has negative effects on financial returns. Since Islamic finance goes one step beyond SRI screening by performing financial screening in addition to business screening (where non-shariah compliant companies are excluded), it raises a research topic to be considered.

Therefore, this paper compares the DJIEUR and DJSEUR return performance against a conventional benchmark European portfolio. The hypothesis has it that additional screening results in a less profitable index, so that the DJIEUR would perform worse than the DJSEUR. A conventional market index allows the inclusion of all stocks, so therefore should have better returns than both sustainable and Islamic portfolios according to Capelle-Blancard and Monjon, (2012):

Hypothesis 1: Shariah-compliant index performs with lower risk-adjusted returns than SRI index, against a market benchmark

Hypothesis 2: Shariah-compliant index exhibits lower risk factors than SRI index.

3.2 Methodology

The CAPM is the first asset-valuation model initially introduced and developed in the 1960's by Sharpe, Litner, Mossin and Treynor. The basic CAPM model specifies that the excess return $E(R_i)$ relates to the firm-specific risk (alpha) and the systematic risk (beta). The relationship between expected return and beta is linear, and the model can be specified as below:

(1) $E(R_i) = R_f + (R_m - R_f)b_i$

In this expression, $E(R_i)$ is the expected return on an asset or portfolio; R_f is the rate of return on risk-free assets; $R_m$is the market portfolio return; $R_m - R_f$ is the market premium over the risk-free rate; and b_i is the systematic risk index.

Following the development of the CAPM model, Lintner (1965) was able to use the theory behind to test its corresponding linear regression model as follows:

(2) $R_{it} - R_{ft} = \alpha_i + \beta_{1i}(R_m - R_f) + \mu_{it}$

Where alpha (α_i) is the excess return of the index beyond the market, beta(β_{1i}) reflects the relationship between the index's return over the risk-free rate and the market return over the risk-free rate, as well as the firm-specific risk. Systematic risks refer to risks that companies cannot directly mitigate or avoid, such as the COVID global pandemic that resulted in a stock market crash in 2020. This type of risk is inevitable for investors across the world and cannot be excluded through diversification. On the other hand, firm-specific risks, also known as unsystematic risks, are entirely avoidable through portfolio diversification and reallocation. This type of risk refers to the risk an individual company may face, such as bad management, flawed business models, liquidity issues, or worker strikes. The difference in between is that firm-specific risks impact a company individually and can be mitigated by replacing poorly performing indices, whereas systematic risk is risk that is unavoidable and may largely impact the market, such as the occurrence of natural disasters, inflation, interest rate changes, or war. A positive alpha indicates positive excess return that cannot be attributed to the general movements in the market, and a beta value higher than 1 would indicate a risky portfolio, meaning that its movements are larger than those of the market.

The basic CAPM model has proven useful, however, the model itself contains only one explaining independent variable. This has motivated researchers to test the validity of the CAPM theory and explore additional influencing factors other than systematic risk to improve the existing model. Their research show that the relationship between excess return and beta is much too flat or weak due to measurement error problems, which in turn leads to an alpha value that is too high, along with a beta value that is too low, in turn, such model becomes a biased estimator (Bodie, Kane and Marcus, 2013).

In order to improve the efficiency and validity of CAPM, Fama and French (1996) proposed a three-factor model which allowed the inclusion of other influencing factors such as value, quality, size, or momentum. The 3FF model can be expressed as seen below:

(3) $R_{it} - RF_t = \alpha_i + \beta_i(RM_t - RF_t) + s_i SMB_t + h_i HML_t + \varepsilon_i$

The systematic factors in the 3FF model include market index, firm size, and book-to-market ratio, where SMB denotes the differences in returns between a portfolio with a small market capitalization and one with a large market capitalization (size factor); HML refers to the

differences in return between a portfolio of high book-to-market stocks and one of low book-to-market stocks (value factor), or the difference in return between 'growth' stocks and 'value' stocks.

The size factor is constructed by sorting stocks in the European region into two market caps and three book-to-market groups at the end of each June. Big stocks are those in the top 90% of June market cap for the region, and small stocks are those in the bottom 10%. The book-to-market breakpoints for a region are the 30^{th} and 70^{th} percentiles of book-to-market for the big stocks of the European market. The construction behind the influencing factors in the Fama French model is retrieved from the Kenneth and French Library (2022) and can be described as follows:

SMB is the equal-weight average of the returns on the three small stock portfolios for the region minus the average of the returns on the three big stock portfolios,

SMB = 1/3 (Small Value + Small Neutral + Small Growth) – 1/3 (Big Value + Big Neutral + Big Growth).

HML is the equal-weight average of the returns for the two high B/M portfolios for a region minus the average of the returns for the two low B/M portfolios,

HML = 1/2 (Small Value + Big Value) – 1/2 (Small Growth + Big Growth)

The addition of these two independent variables allows the bias in arranging portfolios based on size and level of risk exposure to be controlled, resulting in a much more reliable estimation of the 3FF model in comparison to that of a single factor CAPM model. Fama & French also tested the basic CAPM model by including other variables such as leverage and earnings/price ratio. However, these variables failed to show promising results, whereas firm size proved to have a negative relationship with average returns, and stocks with higher book-to-market ratio demonstrated higher average returns (Fama & French, 1992).

The values of the coefficients s_i and h_i are interpreted as a portfolio's composition based on its market capitalization and book-to-market. A significantly positive s_i value indicates higher

portfolio exposure for companies with small market capitalization, whereas a significantly negative s_i value denotes a higher portfolio exposure for companies with a large market capitalization. A significantly positive value of h_i shows that the portfolio tested is more exposed to companies with a high book-to-market ratio (Fama and French, 2004; Qoyum et al., 2021).

Although the Fama-French 3FF model proved successful when mitigating average CAPM error, it lacked an explanation for the cross-section variation in momentum-sorted portfolio returns. This motivated Carhart (1997) who further investigated the 3FF model by including an additional independent variable known as the momentum factor. His study bases itself on the findings of those of Jagdeesh and Titman (1993), where they found the tendency for good and bad performance effect of stocks to persist for several months, this can be known as the momentum factor. Carhart formulated the 4FF model by incorporating the momentum factor into Fama-French 3FF model, as seen below:

(4) $R_{it} - RF_t = \alpha_i + \beta_i(RM_t - RF_t) + s_i SMB_t + h_i HML_t + m_i MOM_t + \varepsilon_i$

The 4FF model remains in the same formation as the previously introduced Fama-French 3FF model, with the inclusion of a 4th independent variable, where MOM_t is the difference in return between a portfolio composed of past 1-month winners and a portfolio of past 12 months losers, also known as the premium of momentum. What underlies the 4FF model is that investment managers obtain higher portfolio returns on up-stocks (high momentum) rather than on portfolios with down-stocks (low momentum) (Qoyum et al., 2021).

The study also measures the correlation between the DJIEUR and DJSEUR index. The correlation coefficient is used to measure the strength of (linear) association of two variables, which in this case is applied to returns on DJIEUR and DJSEUR. The formula for sample correlation coefficient is as follows:

(5) $r = \frac{Cov(X,Y)}{S_x S_y}$

Where $Cov(X,Y)$ is the covariance of DJIEUR and DJSEUR and S_x and S_y represent the standard deviation of DJIEUR and DJSEUR. Correlation range can fall anywhere from -1 to 1.

A negative correlation value indicates a negative relationship between two variables, where vice versa, a positive measurement indicates a positive relationship.

3.3 Data description

The data in this study comprises of monthly data on three major individual stock indices, including Islamic, SRI and conventional indices. Namely the Dow Jones Islamic Europe Index (DJIEUR), the Dow Jones Sustainability Europe Index (DJSEUR), and the Financial Times Stock Exchange 100 Index (FTSE100) over the periods of October 2005 and July 2021 with 190 observations.

The Dow Jones launched the first global Shariah-compliant index, the Dow Jones Islamic World Index in 1999 and this index has since become widely used in academic research. For this paper, we compare the performance of their European based counterparts (including the United Kingdom).

The monthly closing data for the DJIEUR, DJSEUR are retrieved from the Thomson Reuters database and represented in US dollars for performance analysis. The DJIEUR index compared to alternative indices such as Morgan Stanley Capital International (MSCI) and Standard and Poor's (S&P) offers the most comprehensive data supply as well as the longest time-series data, and therefore chosen to be studied in this paper (Asutay et al., 2021). The DJIEUR index is comprised of 332 constituents, where the DJSEUR comprises of 152 constituents (Dow Jones, 2022).

All the independent variables used in this study, ranging from $(RM_t - RF_t)$, SMB_t, HML_t, and MOM_t are retrieved directly from the Kenneth-French Data Library. All returns are computed in US dollars, where the market represents the return on Europe's value-weighted market portfolio minus the US one month T-bill rate as the risk-free rate.

4. Empirical Analysis and Results

4.1 Comparison and correlation of Islamic and SRI returns

In Figure 1 the raw returns of the DJIEUR and DJSEUR are presented together and compared to a standard conventional index known as the FTSE100 for benchmarking and clearer reference.

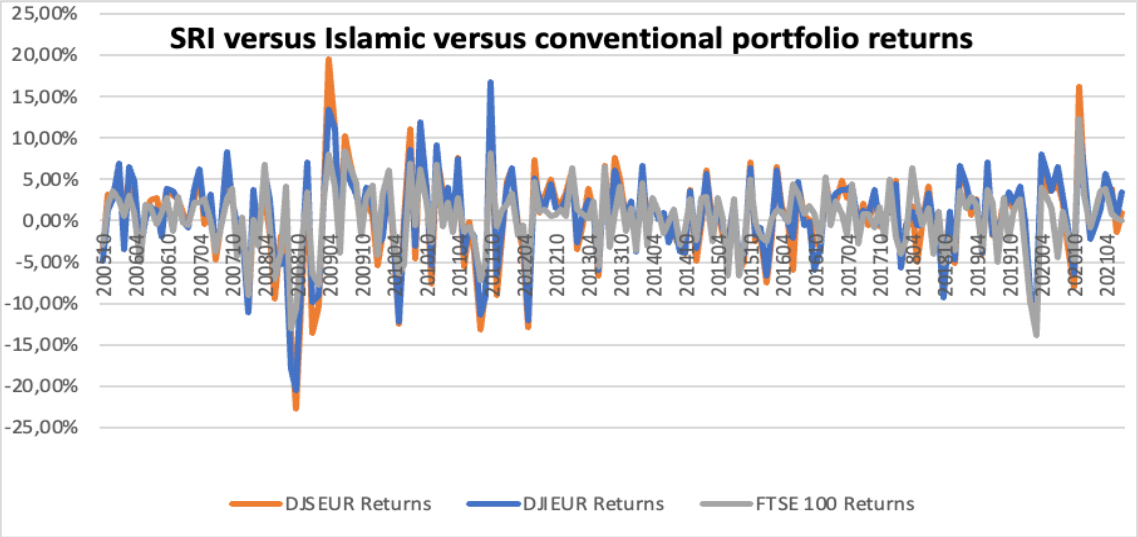

Figure 1 – Comparison of DJIEUR and DJSEUR raw returns

It can be highlighted that the indication of high correlation between the three portfolios is visually apparent, the SRI and Islamic portfolios in specific behave most similarly. Using the correlation formula, Figures 2, 3 and 4 examine the relationship between DJIEUR, DJSEUR and FTSE100 returns. Figure 2 represents a strong positive correlation between the DJIEUR and DJSEUR at a value of 0.96, where a correlation of 1 implies that two variables move in the same direction with the same magnitude.

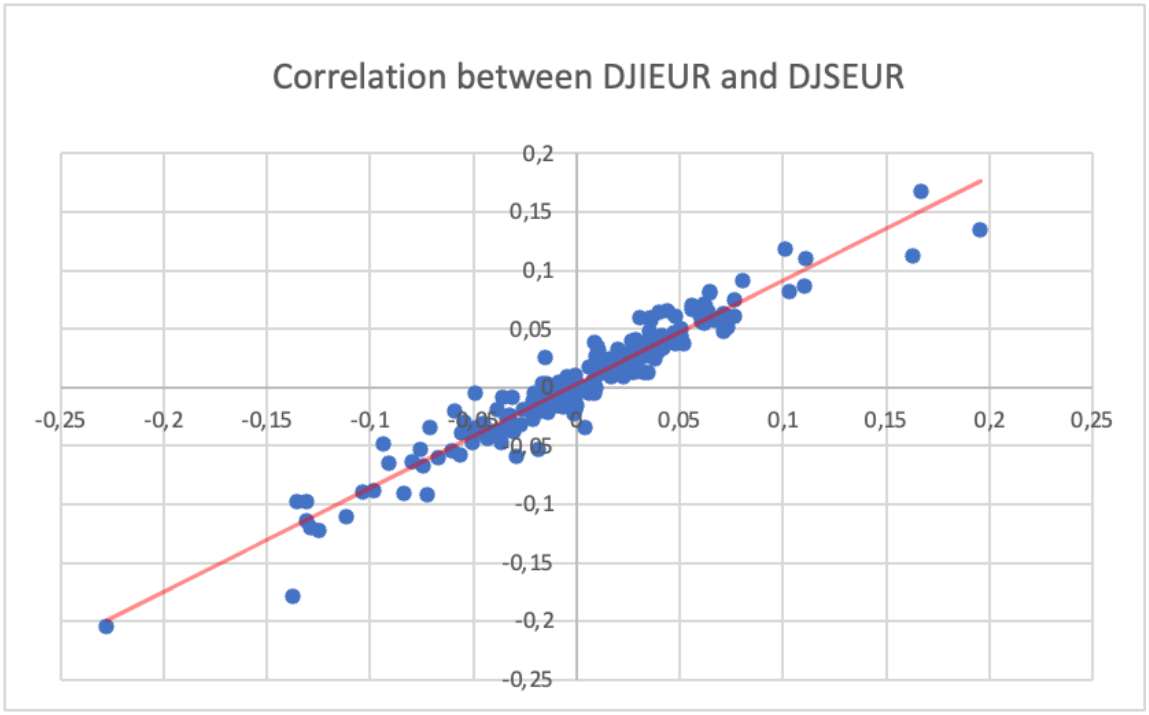

Figure 2 – Correlation between DJIEUR and DJSEUR

This means that the Islamic and SRI returns move almost identically to one another. Comparatively, the correlation between the FTSE100, the DJIEUR and the DJSEUR can be seen in Figures 3 and 4.

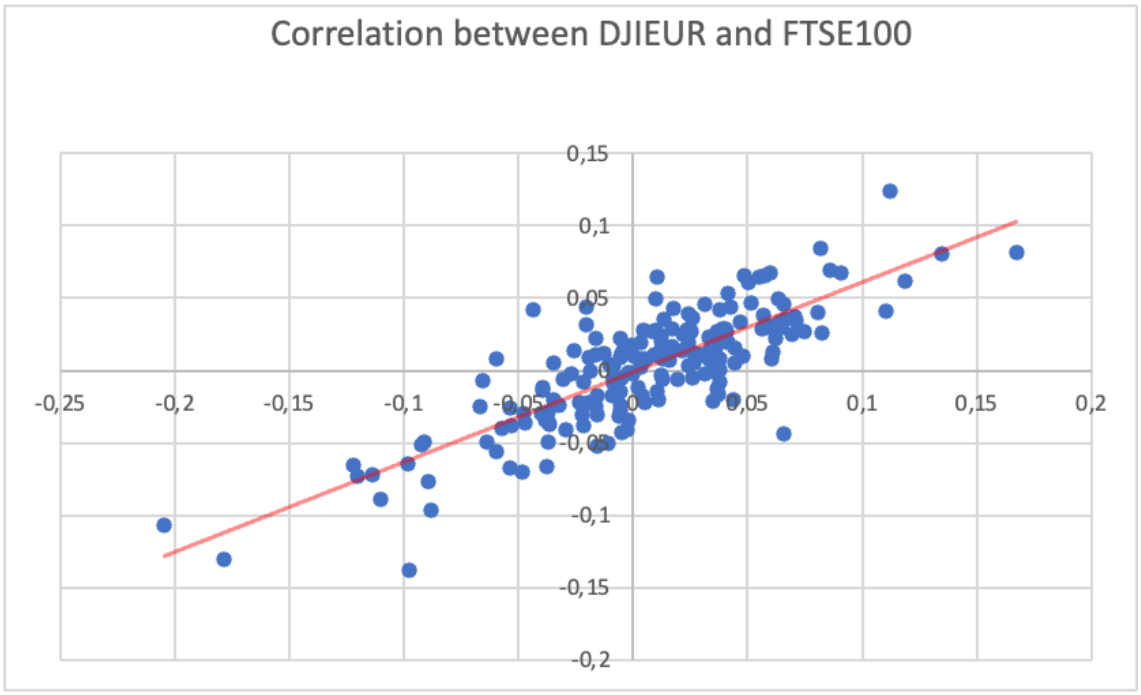

Figure 3 – Correlation between DJIEUR and FTSE100

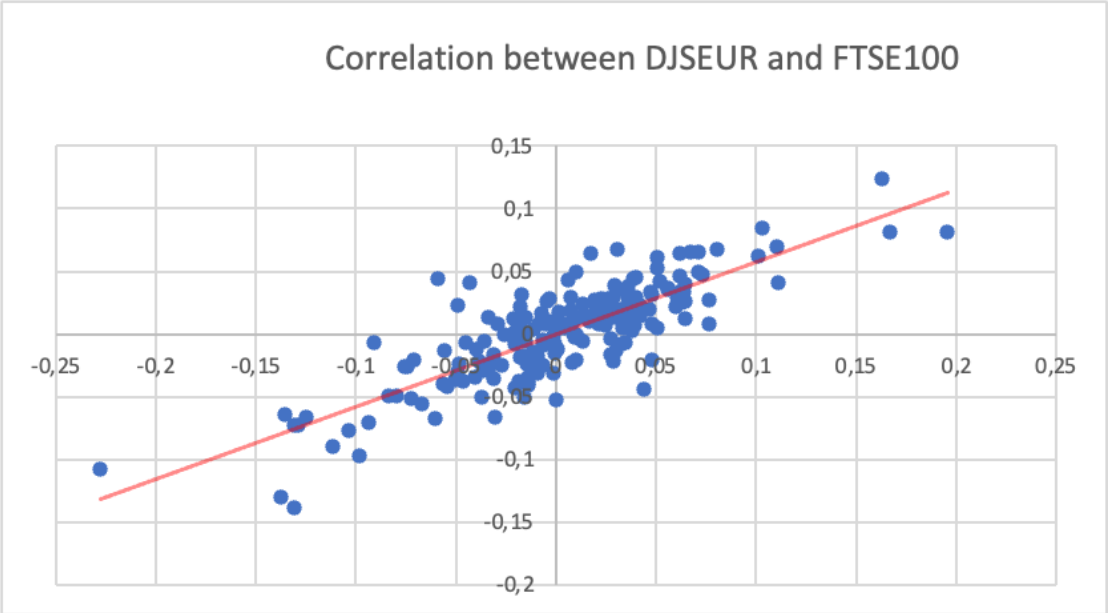

Figure 4 – Correlation between DJSEUR and FTSE100

Both the Islamic and SRI indices are closely and positively tied with the FTSE100 at a correlation of 0.82 and 0.81, respectively. The cluster shows how closely the indices move in relation with one another, however, it is apparent that the correlation is much higher between the SRI and Shariah indices. The correlation among the independent variables have been investigated by Fama and French (1993) and they concluded that the correlation effect was below -0.1. Therefore, the correlation analysis is not performed for those variables for the purpose of this paper.

Figure 1 shows a noteworthy downward spike for all the indices during the 2008 period. This can be explained, as the year of 2008 witnessed a global financial crisis that was induced by cheap credit and heavy uses of leverage. During October of 2008, both indices suffered largely from the effects of the global financial crisis. The DJIEUR shows a return of – 20.5%, and DJSEUR presented an even lower return of -22.7%. This is where the lowest returns throughout the entire data series can be observed for both indices and has been documented as the lowest return values throughout 2005-2021. It is important to mention, as previously discussed in the literature review section, that Islamic indices do not include companies heavily financed through debt, this could explain why the DJSEUR index shows a much larger drop in returns during this financial crisis rather than the DJIEUR. The DJIEUR in this case can prove more

efficient in mitigating volatility levels an investor might face during inevitable market crashes. Another market crash worth mentioning is one which occurred more recently due to the global Coronavirus pandemic, however, the effects can be seen most devasting for the conventional index, where the FTSE100 had a −14% return.

4.2 Descriptive statistics

The descriptive statistics for DJIEUR and DJSEUR are presented in Table 3.

All statistics are calculated by using the monthly data for the whole period of observation from October 2005 to July 2021. The data sample is comprised of 190 total monthly observations.

Standard deviation is the most important measurement of deviation and is used to determine and assess index volatility/risk. Standard deviation measures how widely the index returns have dispersed from their average return (mean return). If standard deviation is low, it means that the returns of the index deviate in a narrow range to the mean return. Conversely, a high standard deviation would indicate prices and returns of the index tend to swing wildly up and down, which represents high volatility (Karhula, 2010).

Table 3 – Descriptive statistics of DJIEUR and DJSEUR

STATISTICS	**DJIEUR**	**DJSEUR**
Mean	0.58%	0.34%
Standard Error	0.38%	0.41%
Median	0.95%	0.78%
Standard Deviation	0.052	0.056
Sample Variance	0.003	0.003
Minimum	– 0.20	– 0.23
Maximum	0.17	0.20
Sum	1.1011	0.6485
Count	190	190

It is apparent from the mean returns observed in Table 3 that the DJIEUR performed better through the observed period with a value of 0.58% in comparison to the value of 0.34% received by DJSEUR. The observed standard deviation for both DJIEUR and DJSEUR can be seen with low values at 0.38% and 0.41%, respectively. The low value of standard deviation indicates low volatility for investors who invest in DJIEUR and DJSEUR. It shows that the monthly returns do not deviate largely from the index's mean returns. The variance for both the indices returns the exact same value at 0.003. The minimum and maximum values show the lowest and highest returns received from investing in the DJIEUR and DJSEUR throughout the entire observation.

4.3 Empirical results of DJIEUR and DJSEUR using Fama-French three-factor model

Tables 4 and 5 report the empirical findings of the 3FF Fama-French model when applied to the DJIEUR and DJSEUR. The results include the entire series containing 190 monthly observations for both indices.

Table 4 – DJIEUR Fama-French three-factor regression results

DJIEUR 3FF Regression Statistics				
Multiple R				0,9672
R Square				0,9355
Adjusted R Square				0,9344
Standard Error				0,0133
Observations				190
	Coefficients	**Standard Error**	**t Stat**	**P-value**
Intercept	-0,0016	0,0001	-1,6758	0,0955
Rm - Rf	0,9978	0,0206	48,5185	0,0000
SMB	-0,1002	0,0522	-1,9186	0,0566
HML	-0,3811	0,0437	-8,7129	0,0000

The R^2 value measures how well the regression model is at explaining the variations in the return performance of DJIEUR and DJSEUR, or how much of the variation in portfolio returns can be explained by the independent variables used in the three-factor regression model.

Table 4 shows DJIEUR three-factor regression results with a R^2 of 0,9344, this means that approximately 94% of the changes in DJIEUR's return performance can be explained by the independent variables in the 3FF model. The R^2 of DJSEUR returns a similar value at approximately 94% as depicted in Table 5. However, the adjusted R^2 serves as a more reliable goodness of fit indicator than the R^2. This is because the adjusted R^2 considers the number of independent variables used to predict the changes in our dependent variable. On the other hand, R^2 does not decrease even if redundant independent variables are added to the model, therefore, the outputs of the adjusted R-squared are considered more reliable when the regression model contains more than one independent variable. The adjusted R-squared for both indices do not differ from the R-squared value, documented both at approximately 94%.

Table 5 – DJSEUR Fama-French three-factor regression results

DJSEUR 3FF Regression Statistics				
Multiple R				0,9745
R Square				0,9496
Adjusted R Square				0,9488
Standard Error				0,0126
Observations				190
	Coefficients	**Standard Error**	**t Stat**	**P-value**
Intercept	-0,0029	0,0009	-3,0701	0,0025
Rm - Rf	0,9857	0,0196	50,2683	0,0000
SMB	-0,2002	0,0498	-4,0214	0,0001
HML	0,0612	0,0417	1,4675	0,1439

One way to measure if the SRI and Islamic indices outperform the market is by looking at their regression result's alpha. Alpha is the difference between a fund's expected risk adjusted return and the actual realized return. If the active portfolios generate positive alphas this will be an indication of the effectiveness of active portfolio management (Abu-Alkheil et al., 2017). The index's alpha or intercept show DJIEUR with an intercept coefficient of -0,0016, and -0,0029 for the DJSEUR. This means that the DJIEUR and DJSEUR underperformed the regression-based benchmark by those amounts. However, the intercept of the Islamic index has a p-value of 0,0955, which indicates that this effect is not significant at 5% significance level. Whereas the p-value for the intercept of the sustainable index is 0,0025, meaning that the alpha effect is significant. This shows us that both portfolios provide negative excess returns when compared to the value-weighted European regression benchmark portfolio. However, the Islamic portfolio performed better than the DJSEUR.

For the market beta, which is calculated from the risk premium, DJIEUR received a value of 0,9978 whereas the DJSEUR had a beta of 0,9857. This indicates that although the DJIEUR and DJSEUR share similar risk levels, the DJIEUR returns are subject to slightly more risk and slightly better results. The beta coefficients for both the indices appear to be statistically significant when observing their corresponding p-values and can be concluded that the SRI index appears to carry less systematic risk than the market as well as the Islamic index. However, both the SRI and Shariah-compliant portfolios have negative returns despite the lower levels of risk, meaning that a positive risk–reward relationship is not observed in this case for either index.

According to (El-Masry et al., 2016), incorporating CAPM with other factors such as SMB and HML is more appropriate because they improve the pricing performance. Tables 4 and 5 show the results of the 3FF regression using the SMB factor, which is also known as the size factor. The DJIEUR and DJSEUR both have a negative SMB coefficient, where the DJIEUR received a coefficient -0,1002 with p-value of 0,0566. slightly above the significance level, and the DJSEUR received a size factor coefficient of -0,2002 with a significant p-value at 0,0001. This would mean that the stocks in the DJIEUR and DJSEUR are composed primarily of large capitalization stocks that outperform stocks with small market capitalization throughout the period of 2005 and 2021, the DJIEUR is also less sensitive to firm size since its coefficient is less than that of DJSEUR. The last influencing independent variable in the

3FF model is the HML, which is also known as the value factor. The DJIEUR has a coefficient of -0,3811 with p-value at 0,000 for this variable. This variable can be interpreted as significant at the 5% level and explains that the DJIEUR mainly contains growth stocks, and that these stocks outperform value stocks. However, the DJSEUR has a positive HML value of 0,0612, which explains that the SRI index contains mainly of value stocks and that they outperform growth stocks. The HML value is also significant for the DJIEUR index with p-value of 0,0000 while the factor is interpreted as insignificant for the DJSEUR at a p-value of 0,1439. Although some of the factors in the regression results are not significant, the high adjusted R-squared value shows that the factors used in the 3FF model explain over 90% of the changes in both portfolio returns.

4.4 Empirical results of DJIEUR and DJSEUR using Carhart four-factor model

With the continuation of improvements to the CAPM model, Carhart (1997) proposed an additional independent variable to the 3FF model. He argued in his research using mutual funds that returns are also influenced by a momentum factor. Momentum refers to the speed at which price changes occur.

According to the Kenneth and French Library (2022), Momentum (MOM) is calculated as the equal-weight average of the returns for the two winner portfolios in the European region minus the average of the returns for the two loser portfolios:

(6) MOM = 1/2 (Small High + Big High) – 1/2 (Small Low + Big Low).

Research such as those of Qoyum et al., (2021b) and Binmahfouz (2012) show that the Carhart 4FF model is better at explaining the variations in the dependent variable than the previous 3FF model. Therefore, we apply the 4FF to the test in this paper to examine whether momentum played a major role in the variations of DJIEUR and DJSEUR returns.

Table 6 shows the regression outputs of the 4FF Carhart model when applied to DJIEUR returns.

After including the momentum factor, we can notice that the alpha, beta, SMB and HML coefficient changing, however, these differences in value are relatively small. We see a positive value of 0,0366 when observing the coefficient of the 4th momentum factor, followed by a p-value

of 0,2469 which is deemed as insignificant at the 5% significance level. This positive value for the momentum factor indicates that there is a momentum effect on stocks in the DJIEUR in the observed period. However, the p-value indicates that the momentum effect is not significantly efficient at explaining the variations in DJIEUR returns, and that the inclusion of this factor does not result in a better model. It can also be concluded that the adjusted R^2 remain approximately at the same value in both the 3FF and 4FF models, where the 4FF has a R^2 of 93.46%.

Table 6 – DJIEUR Carhart four-factor regression results

DJIEUR 4FF Regression Statistics				
Multiple R				0,9674
R Square				0,9359
Adjusted R Square				0,9346
Standard Error				0,0133
Observations				190
	Coefficients	**Standard Error**	**t Stat**	**P-value**
Intercept	-0,0019	0,0010	-1,8914	0,0601
Rm - Rf	1,0039	0,0212	47,3640	0,0000
SMB	-0,0999	0,0522	-1,9150	0,0570
HML	-0,3555	0,0489	-7,2624	0,0000
MOM	0,0366	0,0315	1,1616	0,2469

In contrast, Table 7 displays the effects of momentum on the DJSEUR index.

Table 7 – DJSEUR Carhart four-factor regression results

DJSEUR 4FF Regression Statistics				
Multiple R				0,9755
R Square				0,9516
Adjusted R Square				0,9506
Standard Error				0,0124
Observations				190
	Coefficients	**Standard Error**	**t Stat**	**P-value**
Intercept	-0,0023	0,0009	-2,4408	0,0156
Rm - Rf	0,9722	0,0199	48,9175	0,0000
SMB	-0,2008	0,0489	-4,1056	0,0001
HML	0,0039	0,0459	0,0856	0,9318
MOM	-0,0817	0,0295	-2,7693	0,0062

The results are rather different in comparison to the DJIEUR when considering the momentum factor. The adjusted R^2 is almost the same for DJSEUR in the 3FF and 4FF models, where the R^2 of 3FF is 0,9488 and for the 4FF is 0, 9506.The 4FF model shows the DJSEUR with a negative MOM at -0,0817 and a p-value of 0,0062, which indicates that the coefficient values are very significant. This means that the addition of the momentum factor was useful in predicting the excess (negative) returns in the DJSEUR index. The negative and significant estimate of the momentum factor show that the sustainable portfolio is more so containing of contrarian stocks, as the returns load negatively on this factor, and that down-stock effects persist in the DJSEUR index (Sokolovska and Kešeljević, 2019).

Overall, we can conclude that the previously defined research hypothesis cannot be validated through the empirical results observed, and that the models used in this thesis show to be a decent fit at explaining influencing factors on DJIEUR and DJSEUR returns. The three-factor Fama-French regression results show that the Islamic and socially responsible Dow Jones indices both underperform against their European benchmark portfolio throughout the period of 2005 – 2021. The results also show that the DJIEUR demonstrated better returns than the DJSEUR throughout the observed period. Moreover, the analysis on the beta factor shows that the DJIEUR and DJSEUR tend to be slightly less risky than their benchmark portfolio. In contrast to previous research, the results from the improved Carhart four-factor model show that the inclusion of the momentum factor does not provide meaningful explanation on the variation in DJIEUR returns. However, we do observe a significant down-stock effect when the momentum factor is applied to DJSEUR returns, meaning that the effect of loser stocks tends to persist over winner stocks in this index.

5. CONCLUSIONS AND RESEARCH LIMITATIONS

Shariah-compliant and SRI investing share many similar values, where both investment approaches seek not only successful investment outcomes but also take into consideration the effects of their investment on human rights, the environment, and long-term sustainability. Evidence shows that Shariah-compliant investments achieve higher ESG scores and that the collaboration between SRI and Islamic finance could boost the growth of Islamic finance industries. Furthermore, it is discovered that both SRI and Shariah-compliant portfolios provide similar returns comparing to conventional portfolios, suggesting that integrating Islamic investing into SRI, and vice versa, may potentially provide desirable financial performances while following Shariah principles and fulfilling ethical duties.

The methodology used in this thesis considers the multifactor adjusted CAPM models created by Fama and French in 1992 and 1993, and the Carhart four factor model created in 1997. The three factor and four factor models are chosen as they have remained on center stage in performance research. These models are efficient at neutralizing the anomalies on firm size as well as book-to-market effects. The multifactor models are especially efficient at explaining the changes in DJIEUR and DJSEUR returns, as both are large Dow Jones indices made up of all sized and valued constituents (Karhula, 2010). According to some researchers (Abu-

Alkheil et al., 2017; El-Masry et al., 2016), the four-factor model is better at explaining return performance. This study incorporates the momentum to test these results, and the regression outputs show that while the momentum factor plays a significant role on DJSEUR returns, but not the DJIEUR.

Although the sustainable and Islamic returns both provide negative alphas when compared to the regression based European market, in the 3FF and 4FF, the returns still indicate that these indices are profitable choices. Especially in the case of the DJIEUR, since its negative returns are not considered statistically significant. This means that an investor can invest based on his or her ethical or religious beliefs without having to sacrifice financial results. This is important as the first rule of investing is to generate profit.

Secondly, we examine that both the sustainable and Islamic indices have lower risk in comparison to the benchmark through the period of 2005 – 2021, where the sustainable index has the lowest risk profile of all. The SMB results show that, DJIEUR and DJSEUR both compose primarily of large capitalization stocks, although the DJIEUR is also less sensitive to firm size than DJSEUR. The HML results show that the DJIEUR contains more of growth stocks, and that they perform better than the value stocks making up the index. On the other hand, the outputs for DJSEUR show that value stocks tend to perform better in the index. Overall, it can be determined that the Shariah compliant index does not outperform the benchmark regression index but has slightly better returns.

The Coronavirus pandemic was an unexpected global event that caused a big market crash on February 20th of 2020 that lasted until April 7th of 2020. As previously mentioned in the literature review section of this paper, some researchers have concluded that Shariah investments outperform socially responsible and conventional indices during risky and uncertain times. Therefore, further research should be applied to the daily returns of shariah and socially responsible indices to examine the performance of these two types of investment strategies during a market downturn.

Since shariah scholars have set up certain financial ratios in compliance with shariah investments, further study should also examine whether this results in better performance during financial crisis times, since a typical Islamic would heavily filter out financial institutions from their index constituents.

Lastly, further research should examine the effects of SRI and Islamic investment screening when combined into one. In other words, future research should set to find out whether a portfolio that is both SRI and Shariah compliant generates lower returns due to the heavier screening process it is subjected under.

REFERENCES

Abu-Alkheil, A., Khan, W.A., Parikh, B. and Mohanty, S.K. (2017). Dynamic co-integration and portfolio diversification of Islamic and conventional indices: Global evidence. *The Quarterly Review of Economics and Finance*, 66, pp.212–224. doi:10.1016/j.qref.2017.02.005.

Asutay, M., Wang, Y. and Avdukic, A. (2021). Examining the Performance of Islamic and Conventional Stock Indices: A Comparative Analysis. *Asia-Pacific Financial Markets*, 29, pp.327–355. doi:10.1007/s10690-021-09351-7.

Auer, B.R. (2014). Do Socially Responsible Investment Policies Add or Destroy European Stock Portfolio Value? *Journal of Business Ethics*, 135(2), pp.381–397. doi:10.1007/s10551-014-2454-7.

Bauer, R., Koedijk, K. and Otten, R. (2005). International evidence on ethical mutual fund performance and investment style. *Journal of Banking & Finance*, [online] 29(7), pp.1751–1767. doi:10.1016/j.jbankfin.2004.06.035.

BinMahfouz, S. and Hassan, M.K. (2012). A Comparative Study between the InvestmentCharacteristics of Islamic and Conventional EquityMutual Funds in Saudi Arabia. *The Journal of Investing*, 21(4), pp.128–143. doi:10.3905/joi.2012.21.4.128.

Capelle-Blancard, G. and Monjon, S. (2012). The Performance of Socially Responsible Funds: Does the Screening Process Matter? *European Financial Management*, 20(3), pp.494–520. doi:10.1111/j.1468-036x.2012.00643.x.

Carhart, M.M. (1997). On Persistence in Mutual Fund Performance. *The Journal of Finance*, 52(1), pp.57–82.

Cheong, C.W.H., Salleh, N.I. and Fung, C.Y. (2019). The Complementary Effects of Islam and CSR: Some Empirical Evidence. *Asian Journal of Finance & Accounting*, 11(1), p.1. doi:10.5296/ajfa.v11i1.13976.

Dow Jones, D. (2021). *April 2021 S&P Dow Jones Indices: Index Methodology*. [online] Available at: https://www.spglobal.com/spdji/en/documents/methodologies/methodology-dj-sustainability-indices.pdf.

El-Masry, A.A., de Mingo-López, D.V., Matallín-Sáez, J.C. and Tortosa-Ausina, E. (2016). Environmental conditions, fund characteristics, and Islamic orientation: An analysis of mutual fund performance for the MENA region. *Journal of Economic Behavior & Organization*, 132, pp.174–197. doi:10.1016/j.jebo.2016.10.015.

Erragragui, E. (2018). Do creditors price firms' environmental, social and governance risks? *Research in International Business and Finance*, 45, pp.197–207. doi:10.1016/j.ribaf.2017.07.151.

Erragraguy, E. and Revelli, C. (2015). Should Islamic investors consider SRI criteria in their investment strategies? *Finance Research Letters*, 14, pp.11–19. doi:10.1016/j.frl.2015.07.003.

EUROSIF. (2022). *Eurosif Report 2022*. [online] Available at: https://www.eurosif.org/news/eurosif-report-2022/.

Fama, E.F. and French, K.R. (1993). Common Risk Factors in the Returns on Stocks and Bonds. *Journal of Financial Economics*, 33(1), pp.3–56.

Gaio, C., & Gonçalves, T. C. (2022). Gender diversity on the board and firms' corporate social responsibility. International Journal of Financial Studies, 10(1), 15. https://doi.org/10.3390/ijfs10010015

Gaio, C., Gonçalves, T., & Azevedo, R. (2020). Earnings management: Evidence of listed and unlisted companies in europe. *Innovar*, 30(76), 77-90. https://doi.org/10.15446/innovar.v30n76.85214.

Gaio, C., Gonçalves, T., & Sousa, M. V. (2022). Does corporate social responsibility mitigate earnings management?. *Management Decision*. https://doi.org/10.1108/MD-05-2021-0719

Gonçalves, T. C. (2022). The Impact of Discretionary Measurement Criteria on Investors' Judgement and Decisions. *Games*, 13(1), 3. https://doi.org/10.3390/g13010003

Gonçalves, T. C., Borda, J. V. Q., Vieira, P. R., & Matos, P. V. (2022). Log Periodic Power Analysis of Critical Crashes: Evidence from the Portuguese Stock Market. *Economies*, 10(1), 14. https://doi.org/10.3390/economies10010014

Gonçalves, T. C., Dias, J., & Barros, V. (2022). Sustainability Performance and the Cost of Capital. *International Journal of Financial Studies*, 10(3), 63. https://doi.org/10.3390/ijfs10030063

Gonçalves, T., Gaio, C., & Ferro, A. (2021). Corporate social responsibility and earnings management: Moderating impact of economic cycles and financial performance. *Sustainability*, 13(17), 9969. https://doi.org/10.3390/su13179969

Gonçalves, T. C., & Gaio, C. (2023). Corporate sustainability disclosure and media visibility: Mixed method evidence from the tourism sector. *Journal of Business Research*, 155, 113447. https://doi.org/10.1016/j.jbusres.2022.113447

Gonçalves, T., Gaio, C., & Costa, E. (2020). Committed vs opportunistic corporate and social responsibility reporting. *Journal of Business Research*, 115, 417-427. https://doi.org/10.1016/j.jbusres.2020.01.008

Gonçalves, T. C., Gaio, C., & Rodrigues, M. (2022). The Impact of Women Power on Firm Value. *Administrative Sciences*, 12(3), 93. https://doi.org/10.3390/admsci12030093

Gonçalves, T., Pimentel, D., & Gaio, C. (2021). Risk and performance of European green and conventional funds. *Sustainability*, 13(8), 4226. https://doi.org/10.3390/su13084226

Hussein, K. (2009). *Islamic Investment: Evidence From Dow Jones and FTSE Indices*. [online] Available at: http://www.iefpedia.com/english/wp-content/uploads/2009/10/Islamic-Investment-Evidence-From-Dow-Jones-and-FTSE-Indices.pdf [Accessed 24 Sep. 2021].

Ismail, N. and Muqorobin, A. (2017). Implementation of Corporate Social Responsibility (CSR) On Islamic Banking: Maqasid Sy ariah' s Approach. *Islamic Economics Journal*, 3(1). doi:10.21111/iej.v3i1.1384.

Kalim Hyder Bukhari, S. and Azam, M. (2015). A Comparative Returns Performance Review of Islamic Equity Funds with Socially Responsible Equity Funds and the Broader Market Indices. *THE LAHORE JOURNAL OF ECONOMICS*, 20(2), pp.53–75. doi:10.35536/lje.2015.v20.i2.a3.

Karhula, M. (2010). Performance of Islamic Ethical Investment.

Khaled and Hussein, A. (n.d.). *Islamic Investment: Evidence From Dow Jones and FTSE Indices*.

Lintner, J. (1965). SECURITY PRICES, RISK, AND MAXIMAL GAINS FROM DIVERSIFICATION*. *The Journal of Finance*, 20(4), pp.587–615. doi:10.1111/j.1540-6261.1965.tb02930.x.

Madime, E., & Gonçalves, T. C. (2022). Determining Factors For Social and Environmental Practices of Corporate Responsibility in Mozambique. *Revista de Gestão Social e Ambiental-RGSA*, 16(2), e03002-e03002. https://doi.org/10.24857/rgsa.v16n2-017

Madime, E., & Gonçalves, T. C. (2022). Consequences of Social and Environmental Corporate Responsibility Practices: Managers' Perception in Mozambique. *International Journal of Financial Studies*, 10(1), 4. https://doi.org/10.3390/ijfs10010004

Mahfooz, S. and Ahmed, H. (2014). Shariah Investment Screening Criteria: A Critical Review. *Journal of King Abdulaziz University-Islamic Economics*, 27(1), pp.3–38. doi:10.4197/islec.27-1.1.

Malik, R., Nurullah, M. and Dar, H. (2015). Incorporating Socially Responsible Principles in Islamic Investments: An Empirical Analysis. *İSLAM EKONOMİSİ VE FİNANSI DERGİSİ*, [online] 1, pp.65–105. Available at: https://repofeb.undip.ac.id/id/eprint/1065 [Accessed 12 Oct. 2022].

Mansor, F., Bhatti, M.I., Rahman, S. and Do, H.Q. (2020). The Investment Performance of Ethical Equity Funds in Malaysia. *Journal of Risk and Financial Management*, 13(9), p.219. doi:10.3390/jrfm13090219.

Miglietta, F. and Forte, G. (2011). A Comparison of Socially Responsible and Islamic Equity Investments. *SSRN Electronic Journal*. doi:10.2139/ssrn.1819002.

PricewaterhouseCoopers (2009). *Asset Management *connectedthinking Shariah-compliant funds: A whole new world of investment**. [online] Available at: https://www.pwc.com/gx/en/financial-services/islamic-finance-programme/assets/shariah-compliant-funds.pdf.

Qoyum, A., Al Hashfi, R.U., Zusryn, A.S., Kusuma, H. and Qizam, I. (2021a). Does an Islamic-SRI portfolio really matter? Empirical application of valuation models in Indonesia. *Borsa Istanbul Review*, 21(2), pp.105–124. doi:10.1016/j.bir.2020.08.002.

Qoyum, A., Sakti, M.R.P., Thaker, H.M.T. and AlHashfi, R.U. (2021b). Does the islamic label indicate good environmental, social, and governance (ESG) performance? Evidence from sharia-compliant firms in Indonesia and Malaysia. *Borsa Istanbul Review*. doi:10.1016/j.bir.2021.06.001.

Sokolovska, I. and Kešeljević, A. (2019). Does sustainability pay off? A multi-factor analysis on regional DJSI and renewable stock indices. *Economic Research-Ekonomska Istraživanja*, 32(1), pp.423–439. doi:10.1080/1331677x.2018.1550002.

Suryomurti, W. (2018). Constructing an Islamic Socially Responsible Investment (SRI) Index; The Case of Indonesia. *Tazkia Islamic Finance and Business Review*, 11(2). doi:10.30993/tifbr.v11i2.141.

Wajdi Dusuki, A. and Irwani Abdullah, N. (2007). Why do Malaysian customers patronise Islamic banks? *International Journal of Bank Marketing*, 25(3), pp.142–160. doi:10.1108/02652320710739850.

Widyawati, L. (2019). A systematic literature review of socially responsible investment and environmental social governance metrics. *Business Strategy and the Environment*, 29(2), pp.619–637. doi:10.1002/bse.2393.

Wilson, R. (1997). Islamic finance and ethical investment. *International Journal of Social Economics*, 24(11), pp.1325–1342. doi:10.1108/03068299710193624.

Yesuf, A.J. and Aassouli, D. (2020). Exploring synergies and performance evaluation between Islamic funds and socially responsible investment (SRIs) in light of the Sustainable Development Goals (SDGs). *Heliyon*, 6(8), p.e04562. doi:10.1016/j.heliyon.2020.e04562.

Yildirim, R. and Ilhan, B. (2018). *Shari'ah Screening Methodology- New Shari'ah Compliant Approach*. [online] mpra.ub.uni-muenchen.de. Available at: https://mpra.ub.uni-muenchen.de/90277/ [Accessed 24 Sep. 2021].

Zinkin, J. and Williams, G.A. (2006). Islam and CSR: A Study of the Compatibility between the Tenets of Islam and the UN Global Compact. *SSRN Electronic Journal*. doi:10.2139/ssrn.905201.

Zvi Bodie, Kane, A. and Marcus, A.J. (2013). *Essentials of investments*. New York, Ny: Mcgraw-Hill/Irwin.